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## Amendments to the sides

. سعوانز

This listing of comes will replace all prior versions, and listings, of claims to the application.

### Listing of Claims

- 1. (Previously mended) A method for operating an opt. all crossbar sv tch having a plurality of selectable reflective of stical switching elements, said method comprising:
  - focus: J a selected input light beam on a fir:
    selected relective optical switching element, the irst
    selected relective optical switching element directing
    the selected input light beam to a first output;
    selecting a second reflective optical switching
    element; and
  - varyin a focus of said selected input light am to focus said elected input light beam on said secon selected relective optical switching element, the econd selected relective optical element directing the selected in at light beam to a second output.
- 2. (Previousl Amended) A method as in claim 1, where said focusing coprises varying a focal length of an addive optical element.
- 3. (Original) method as in claim 2 wherein said ada ive optical el ent comprises a variable mirror device
- 4. (Original) method as in claim 2 wherein said ada ive optical el ent comprises a variable lens.
- 5 to 19 (Cancel d).

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20....(Currently Amondad) \*\* method as in any one of claims as claim 4 and 19 where a said variable lens comprises a variable micro-machi ed membrane lens.

21. and,

(Previously Amended) n optical crossbar switch for switching input ligh beams, the switch comprising: at least one ac tive optical element having a focal length variable over a range, the adaptive optical element located in a ath of a selected input light beam;

input light beam to outputs;

a plurality of :lectable reflective optical elements, said selective optical elements alternatively select le and interposable in the path of the selected input 1 ht beam to direct the selected corresponding one of a plurality of

selected input light eam.

wherein more than on of said selectable reflective optical elements are ocated within the range over which said adaptive optica element is capable of focusing said

22. wherein said adaptiv variable mirror devi

(Original) An optica crossbar switch as in claim 21, optical element comprises a

23. wherein said adaptiv variable lens.

(Original) An optica crossbar switch as in claim 21, optical element comprises a

24. (Previously Amended) claim 23 wherein sai micro-machined membr

n optical crossbar switch as in variable lens comprises a variable e lens.

25. (Previously Added) A signal from an input plurality of output

apparatus for directing an optical hannel to a selected one of a annels, the apparatus comprising:

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a plurality of individue switchable reflective elements located to intercept in optical signal from the input channel, the plurality having a plurality of selecta a configurations, each of the configurations directing corresponding one of the outp configurations the optical sic one of the reflective element:

at least one adjustable : optical path between the input of reflective elements, the at optical element configured to onto a currently selected one and, upon a different one of t becoming the currently selecte elements, to vary a focus of t element to focus the optical s one of the reflective elements

reflective elements e optical signal to a channels, in each of the il incident on a selected and.

us optical element in an channel and the plurality east one adjustable focus cus the optical signal the reflective elements reflective elements one of the reflective adjustable focus optical nal onto the different

- 26. (Previously Amended) An appara wherein each of the plurality corresponds to one of the plur and in each of the configurati reflective elements is the ref corresponding to the correspon
- s according to claim 25, reflective elements ity of output channels 3 the selected one of the stive element ng output channel.
- 27. (Previously Added) An apparatu wherein each of the plurality reflective elements is movcable state and a non-reflective sta-

according to claim 26 individually switchable etween a reflective

28. (Previously Added) An apparatu: wherein each of the plurality ( reflective elements comprises a substantially flat orientation upright orientation and when the

according to claim 27, individually switchable ember movable between a d a substantially reflective element is in

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\*\* ts reflecting state, the element is \*\* ts substantially ... upright orientation.

- 29. Previously Added) An apparatus accord. g to claim 25, herein each of the plurality of indiv. ually switchable eflective elements comprises a micro-r chined mirror.
- 30. Previously Added) An apparatus accord: g to claim 25, herein the adjustable focus optical el ment comprises ne of: an adjustable focus reflective lement and an djustable focus transmissive element.
- 31. Previously Added) An apparatus accord: 7 to any one of laims 25, 26 and 28 comprising a plure ity of second djustable focus optical elements each ocated in an  $\frac{1}{2}$  ptical path between the plurality of x flective elements and a corresponding one of the output connels.
- 32. Previously Added) An apparatus accordi 1 to claim 31 comprising a plurality of collimating lases, each of the : collimating lenses disposed in an optic \_ path between tene of the plurality of second adjustable focus optical · (lements and a corresponding output chaniel.
- 33. 5 Previously Added) An apparatus accordi f to any one of elaims 25, 26 and 28 comprising a collicating lens cisposed between the input channel and e at least one adjustable focus optical element.
- 34. Previously Added) An apparatus accordi / to claim 25 vacrein the input channel comprises an tical fiber.
- 35. reviously Added) An apparatus accordito claim 25 vierein the plurality of individually sitchable inflective elements comprises a linear ray of microrachined mirrors.

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Amendment to Ric		ison, 09/835,543	August 2003
36. (Provingery Added) An apparatus according to Comba 35.			
		·	the
plui	rali	of individually switchable reflective	Lements
comp	pris	a plurality of linear arrays of micro	achined
mir	rors	he plurality of linear arrays includi	a
mir	ror	responding to each possible combination	of one
of t	the	ut channels and one of the output cha-	els.
37. (Pre	evio	y Added) An apparatus according to cl	1 25,
when	rein	e adjustable focus optical element coi	∷ises a
liq	uid	stal lens.	,
38. (Cu	rren	Amended) A switch for switching opti-	•
sign	nals	mprising:	
	-	rality of optical input channels and a	
plui	rali	of optical output channels;	
	a ]	rality of individually switchable ref	:tive
eler	ment:	each of which is switchable between a	
refl	lect:	state and a non-reflecting state; and	
	<b>a</b> }	rality of adjustable focus optical ele	nts,
each	n of	e adjustable focus optical elements in	t <b>n</b>
_	ical	th between a corresponding one of the	put
	ical	annels and the plurality of individual	
	chal	reflective elements, each of the adju	able
	ıs ol	cal elements capable of focusing an or	cal
sign	nal 1	a the corresponding one of the input c	nnels
	o any	ne of a plurality of the plurality of	
	ividı	y switchable reflective elements , ea	of the
	ralit	of the plurality of individually switch	<u>ble</u>
	<u>lecti</u>	elements located to require a differe	focus
	ing	the adjustable focus optical element;	
	rein	optical signal may be directed from $\epsilon$	elected
	of t	input optical channels to a selected	e of
	outr	optical channels by switching a selec	d one
	the r	ality of reflective elements to its r	lecting
stat	ce ar	djusting a focus of the at least one	

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🚧 🥒 adjustable focus 🐎 tical element corresponding to the selected input of ical channel to focus the optical signal onto the selected reflective element.

actuating a output channels;

39. (Previously Addec A method for directing an optical signal from an ir at channel to a selected one of a plurality of outp : channels, the method comprising: eflective element to direct an optical signal from the i but channel to a selected one of the id,

operating an adjustable focus optical element to focus the optical signal from the input channel onto the reflective elemen

40. (Currently Amende reflecting state.

A method according to claim 39, wherein actuating he reflective element comprises moving the reflective el lent between a position wherein the reflective elemen is in a non-reflecting state and a position wherein, c reflective elements element is in a

flipping the refl orientation to a

41. (Previously Added A method according to claim 40, wherein actuating he reflective element comprises tive element from a substantially flat bstantially upright orientation.

42. mirror.

(Previously Added A method according to claim 39, wherein the reflective element comprises a micro-machined

43.

(Previously Added A method according to any one of claims 39 and 40 mprising providing a second adjustable focus optical eler at in an optical path between the reflective elemen and the selected one of the output channels and adju: ing a focal length of the second

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adjustable focus optical mement to couple the optical signal to the selected one f the output channels.

44. (Previously Added) The met switching the optical sign output channels to a diffe by:

deactivating the ref. different reflective eleme

adjusting the adjust: focus the optical signal ( element.

d of claim 39 comprising from the selected one of the nt one of the output channels

tive element and activating a ; and,

- e focus optical element to
- o the different reflective

45. (Previously Added) A metho wherein activating the discomprises switching the da a non-reflecting state to

according to claim 44, rent reflective element erent reflective element from reflecting state.

46. (Currently Amended) A met! signal from a selected one channels to a selected one channels comprising:

> actuating a reflective selected input and output

> focusing altering a : the selected input channel onto the actuated reflect:

: for directing an optical f a plurality of input f a plurality of output

element corresponding to the annels; and, us of an optical signal from o focus the optical signal element.

47. (Currently Amended) The me focusing an altering the the selected input channe: comprises adjusting a var disposed in an optical pachannel and the reflective

.od of claim 46 wherein us of the optical signal from nto the reflective element le focus optical element between the selected input lement.

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(Previously Added) The method of comprising adjusting a second variable focus disposed in an optical path betweer element and the selected output cha el to couple the optical signal to the selected outp

ical element he reflective channel.

(Previously Amended) A method for r beam in an optical crossbar switch of individually selectable reflecti elements, the method comprising:

irecting a radiation mprising a plurality optical switching

focusing a selected radiation selected reflective optical switchi

am on a first element; tical switching

selecting a second reflective element; and,

ocam on the second

focusing the selected radiatio reflective optical switching elemen